

Proposal of a model to analyze the socio-economic factors influencing the use of public private partnership: an empirical study on Morocco

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Abstract:

This paper aims to discover the socio-economic factors that may explain the use of PPP by Moroccan authorities as an alternative modality for financing and delivering structuring public projects. These factors were identified through an extensive literature review and an exploratory study with experts involved in the PPP process. Thus, primary data were collected through a research questionnaire administered to 174 individuals with a close relationship with the PPP.

The statistical processing and analysis of the collected data was carried out using SPSS Statistics version 26.0 (Statistical Package for the Social Sciences), through which we tried to verify six research hypotheses, of which the following two are considered the main ones: "The deficit recorded in terms of sources of public funding is considered one of the main motivations for the adoption of PPP in Morocco" and "The deficit recorded in terms of sources of public funding is considered one of the main motivations for the adoption of PPP in Morocco".

The study adopted several empirical techniques to be able to confirm or refute the research hypotheses previously formulated, such as PCA analysis, reliability and validity tests, multiple linear regression. The regression results confirm that the variables "budget constraints and shortage of public funding", "taking advantage of the financial capacity of the private sector" and "economic and social development requirement" have a significant influence on the use of PPP, while the other variables "public policy reform" and "meeting the need for public infrastructure and public services" do not register any significant influence on the adoption of the PPP in Morocco.

Key words : Public private partnership, Socio-economic factors, The use of PPP

JEL Classification : D78, H54, K12, Z18

Paper type : Empirical research

1. Introduction

The concept of public private partnership (PPP) is defined by the OECD as "an agreement between the government and one or more private partners (which may include operators and financiers), under which the private partners provide a service in a way that reconciles the government's service delivery objectives with their own profit objectives, with the effectiveness of the reconciliation depending on a sufficient transfer of risk to the private partners" (OECD, 2008, p.12).

This definition of the OECD does not deviate from those presented by other international organizations, since it emphasizes the partnership aspect and the importance of private expertise that is arranged with performance measures and profitability conditioned by objectives to be achieved, as well as compliance with the terms of reference in an uncertain environment where the private partner is best placed to have borne more risk.

In the Moroccan context, the public-private partnership contract is defined as a fixed-term contract by which a public entity entrusts a private partner with the responsibility of carrying out a global mission of design, financing of all or part of the project, construction or rehabilitation, maintenance and/or operation of a work or infrastructure or provision of services necessary for the supply of a public service (law n° 86-12, 2015). First, to analyze the influence of the socioeconomic dimension on the decision to adopt PPP policy is to study the crucial components of public finance that have fostered the emergence of PPP in Morocco.

The economic and financial approach of Morocco, like other countries in the world, has been increasingly oriented towards the private sector in order to provide and finance public projects within the PPP formula. In this context, the public power is in the obligation to seek a new mechanism of financing allowing the alleviation of the budgetary stress and sharing the financing of the investments between the public and private sector. In this perspective, recourse to financing and private engineering via the public-private partnership (PPP) for the realization of public investments would become an obvious choice for most governments (Khaddar & Bensbahou, 2020).

The theoretical basis relating to the PPP has allowed us to follow a gradual logic of analysis so that we can subtract the factors that have a direct or indirect impact on the decision of the public authority to adopt the PPP. In addition, the review of economic literature that focuses on the issue of PPP as well as other modes of cooperation and alliance between the public and the private sector, has presented several reasons justifying the use of PPP as an innovative modality of financing and providing public works. In this sense, this article will try to present one of the results of research work including 17 independent variables distributed in four dimensions, namely: the "socio-economic" dimension object of the present study, "governance dimension", "project dimension" and "international dimension".

The main interest of this research work is to approach and analyze one of the most important challenges facing the public sector in the world, that of the ability of public operators to attract more private capital for the financing of public policies (Khaddar & Bensbahou, 2020).

Our objective through this article is to explain how the main factors of the socio-economic situation favor the use of PPP. For that, we took into consideration the factors having a close relation with the economic, financial, societal and market changes of which the private sector as a determining operator in the conduct of the public finance towards the macroeconomic balance.

To this end, the problematic framing this research work will attempt to test the socio-economic factors influencing the PPP decision in the Moroccan context. Hence, the genesis of this study which aims at understanding how the motivations generated by the concern of improving the socio-economic conditions can direct the public authorities to engage in the process of contracting with the private sector within the framework of the PPP.

In order to do this research work concrete, we consider it important to define the analysis of our problem from several aspects that can contribute to the relevance of the choice of explanatory variables for our problem. In this respect, it is important to first evoke a theoretical framing of our problem through the contribution of some authors from a scientific field positively correlated with the PPP and in various contexts, and secondly, it is also interesting to present the research methodology adopted including the proposal of a conceptual model of research specific to our study that must be tested thereafter by referring to the technique of multiple linear regression. And this, after a study of reliability and validity of the scales of measurement mobilized under this study with the help of Cronbach's alpha and the exploratory factorial analysis.

2. Literature Review

The theoretical framework of our central research question has its origins in the economic theory of transaction costs, which rises, without fundamentally addressing them in depth, major questions relating to the way the public sector operates. This field, combined with other theories, constitutes among others one of the theoretical corpus of public-private partnerships (Hachimi Sanni Yaya, 2005). Thus, the theory of incomplete contracts, the theory of efficiency and the theory of public choice can explain certain aspects of the PPP and as they can justify its theoretical and practical foundation.

The contractual problematic linked to the PPP was considered by Oliver Hart through his two economic models of 1997 and 2003, his approach is illustrated particularly in the second model of 2003, in his analysis he separates two periods in the analysis of the public decision in PPP, the phase of signature and implementation of the contract and the phase of exploitation.

Today the PPP occupies a place which lends it to the attention of all the practitioners and public decision makers throughout the world, as a practice of financing and delivery of public works according to multiple formulas. This diversity in the legal, financial and organizational set-up of the PPP offers a strong possibility of adaptation both in different contexts and in various sectors, which is perhaps considered one of the factors favoring the use of PPP in the world (Khaddar & Bensbahou, 2020).

In the literature PPP was conceived as a public policy device to supplement insufficient public resources and to develop private investment in collaboration with the state (Khaddar and Bensbahou, 2020). Subsequently, it has evolved towards the replacement of public action by private action in several areas of public services through delegation, subcontracting, public-private partnership and even privatization in some areas of public services (Choe, S. C., 2002).

Marty et al., (2006) asserts that among the difficulties intrinsic to public management, likely to be the origin of the failure of public action in terms of the performance of the services provided by the public authorities, the following factors :

- ✓ The absence of external control of performance
- ✓ The absence of the risk of bankruptcy
- ✓ The weakness of investment incentives for public managers
- ✓ The difficulty of obtaining clear and coherent objectives from the supervisory authority
- ✓ The sensitivity of public supervision to pressure groups.

In a new dynamic of partnership governance and in a progressive process of state reform, Hachimi Sanni Yaya (2005) considers that the tightening of budgetary constraints and the decline of the welfare state is the most relevant factors that have led to the public authorities to resort to the private sector in the provision and financing of public services.

In addition to the need to ensure the sustainability of resources and the obvious lack of domestic funding sources, the massive need for public infrastructure in developing countries is also one of the most important factors that have encouraged the adoption of PPPs (Chédor & al., 2011).

Yin Wang & Zhirong Jerry Zhaob (2014) in their study which was conducted on the data of toll roads in the United States between 1985 and 2010 confirm that the decision of using PPP to finance highway projects is strongly affected by traffic demands, fiscal pressures, liberal political ideology and administrative inertia, state wealth, state PPP legislation, and previous PPP adoption experiences in the state and elsewhere.

For example, Yin Wang & Zhirong Jerry Zhaob (2014) confirm in their research result that PPP adoption is driven by the size of the demands for infrastructure services, and positively associated with the wealth of the state, to the existence of PPP legislation and the number of previous PPP projects in the state, but they confirm in the opposite direction that PPP adoption is negatively associated with the number of neighboring states that have adopted the PPP approach, by barriers such as liberal political ideology and administrative inertia .

Regarding the issue of debt and its influence on the public decision to use PPP, Yin Wang & Zhirong Jerry Zhaob (2014) argue that the adoption of PPP projects by public authorities is negatively associated with the level of state debt, probably because states intentionally balance the two substitutes between public and private. This runs counter to the common view that states that have accumulated higher levels of debt are more interested in PPPs.

Similarly, Raj Khusboo et al., (2019) in turn examined in a study that was conducted in the state of Haryana in 2017 and 2018, the factors responsible for the emergence of PPPs in the dairy sector. The result of their work confirms that the main factors for the emergence and evolution of PPP are : Efficient and satisfactory service delivery, profit maximization, cost reduction, in addition to access to market information.

Li et al., (2005b) shows that among the 15 positive attractiveness factors of PPP/PFI that were examined in their study, that 9 factors that are most important in attracting stakeholders to opt for PPP include the desire to solve the problem of public sector budget constraints.

In an effort to empirically compare the differences and similarities regarding the reasons for PPP implementation in developing and developed countries (Ghana and Hong Kong), Robert Osei-KYEI & Albert, P. C. CHAN (2018) find through a questionnaire survey that there are five reasons that essentially explain the adoption of PPP in two control contexts among the twelve factors that have been identified in the literature. They find through a questionnaire survey that there are five main reasons for PPP adoption in the two control settings (Ghana and Hong Kong) out of the twelve factors that have been identified in the literature. They concluded that Ghanaian respondents ranked reasons related to the economic and social benefits of PPP, while those in Hong Kong ranked the reasons related to efficiency and quality of services.

From this perspective, it is important to note that there is a large body of literature in the empirical literature on the reasons/motivations for adopting PPP; however, the majority of previous related studies have offered discussions that are country/economy specific (see e.g. Marin, 2009; Carbonara & Pellegrino, 2014; Osei-Kyei et al., 2014; Ismail, 2013; Liu & Wilkinson, 2011; Li, et al., 2005b; Chou, et al., 2012) or compared between two developed economies/countries (see for example Cheung, et al., 2009b; Chou & Pramudawardhani, 2015).

Morocco is chosen as our research field by what in recent years, the integration of Morocco in sectoral strategies and major projects to ensure an inclusive and sustainable development, make it necessary to exploit the financial, managerial and technical capabilities of the private sector for the success of this strategy.

In this regard, the selection of PPP as a financing strategy in Morocco is more beneficial and interesting for both public policy makers, private operators, practitioners and researchers to understand the factors affecting the decision to adopt PPP.

In the same vein, O. K. Robert et al., (2014) concluded in their result that among the top five ranked reasons (among the 17 selected) influencing the adoption of construction projects in Ghana under the PPP formula, the following factors : reduce the problem of public sector budget

constraint, the private sector has better resource mobility and the ability of the private sector to raise funds for the project.

Malek & Akalkotkar (2016) stated that "Shortage of public funds" as one of the main reasons was ranked first in Gujarat (India) which was explained by the importance of financial resources from the private sector, as well as "Economic development pressure requiring more facilities"; and "High quality of service required" were considered as significant factors in choosing PPP in Gujarat.

Thus, the reason related to "economic development pressure to provide more facilities" was also considered by the authors as one of the main reasons for implementing PPP in Gujarat, Hong Kong and Australia, which was explained by the importance of providing public facilities despite the difference in geographical areas.

Malek and Akalkotkar (2016) also pointed out that the reason of "lack of public funding" was one of the main reasons for most governments to implement PPP projects, and they also considered that the obsession with lack of public investment was one of the main motivations for partnering with the private sector to address the budget deficit.

To our knowledge, no empirical studies on what affects public decisions to adopt PPP as an alternative modality for financing and delivering public projects have been conducted in Morocco. And most studies on PPP adoption have been conducted in the context of developing countries or transition economies where public infrastructure financing was insufficient or in advanced economies where the elements of their successes and failures are combined according to the context. Finally, we would like to point out that this literature review was largely inspired by the work of Khaddar and Bensbahou (2020).

3. Conceptual model and research methodology

3.1. Conceptual model and research hypotheses

The critical factors likely to participate in the emergence of the PPP in our context and which are linked to the present "socio-economic" dimension can be presented in five explanatory variables as listed in the following table :

Table n°1 : List of variables retained by the study

Variable	Code	Sources /Auteurs
Public policy reform	C1-REF_AP	Hachimi Sanni Yaya (2005) ; Jarvis (1999) ; Lacasse (2003); Teisman and Klijn (2002) ; Dwivedi and Gow (1999) ; Divay and Mazouz (2008); Bachir Mazouz (2009), Marty et al., (2006)
Meeting the need for public infrastructure and public services	C2-SAT_BISP	Marty et Saussier (2018) ; Pierre Bernier (2005) ; Chédor et al (2011) ; Li et al., (2005bb); Chan et al., (2009); ; Simon et Clinton (2016)
Budgetary constraints and lack of public funding	C3_Cont_BPFP	Cheung et al., (2010); Osei-Kyei et al., (2014); Chan et al., (2009); Li et al. (2005b); Simon et Clinton (2016); Ismail (2013); Edwards. P. (2003) ; Campagnac et Deffontaines (2012) ; Hachimi Sanni Yaya (2005) ; Kettl (2003)
Taking advantage of the financial capacity of the private sector	C4_Prof_CFSP	Walker et Smith (1995);Osei-Kyei et al., (2014); Simon et Clinton (2016) ; Campagnac et Deffontaines (2012)
The need for economic and social development	C5_EXIG_DES	Malek et Akalkotkar (2016); Simon et Clinton (2016) ; Osei-Kyei et al., (2014); Ismail (2013); Chan et al., (2009); Cheung et al., (2010); Chou et al., (2012)

Source : Authors

First, the formulation of research hypotheses related to our model will be carried out in the manner cited below. This will be done with the objective of confirming or rejecting them through the linear regression technique :

According to Hachimi Sanni Yaya (2005), the reform of public action is a process that has been established in recent years in the public sphere, so it is no longer the traditional "less state" conveyed by neoliberal theorists, but "better state". For him, this also motivates the use of PPPs as an alternative solution for financing and delivering public works, which should complement rather than replace State investment.

Indeed, this logic which is directed towards the analysis of the behaviors of the public power under the influence of the socio-economic model inspired by the dominant neoliberal paradigm to the international scale, pushed us towards the formulation of the following hypothesis :

H.1 : actions that are part of public action reform are more likely to lead to the adoption of PPPs.

Clearly, given the high demand for quality public infrastructure and services in Morocco, and given that the State's investment efforts remain unable to meet the expressed and expected needs in physical and intangible capital, recourse to private capital and expertise within the framework of the PPP can be envisaged as one of the solutions that can help meet these needs in an environment marked by delicate budgetary constraints and structural governance deficits. In this perspective, we assume in our present research work the following hypothesis:

H.2 : The deficit in infrastructure and public services positively affects the emergence of PPP in Morocco

In the situation of shortage of public financing sources, the public power is in the obligation to innovate new alternative solutions allowing to face the budgetary constraints and to bring additional funds in order to alleviate the public financing balances. In the sense of the reflection related to our research study, it is essential to consider the PPP as one of the main alternative solutions to both finance and manage complex public infrastructures in a context of budget constraints. To this end, the hypothesis that can be formulated in this situation is the following:

H.3 : The deficit in public financing sources is considered one of the main motivations for the adoption of PPP in Morocco.

Based on the assumption that the public sector is unable to meet the large deficit in public infrastructure and services alone, private financial capital and engineering is one of the preferred solutions to reduce the financial burden on the government of the country. Therefore, it is important to consider the following hypothesis in this research work:

H.4 : The desire to take advantage of the financial capacity of the private sector is positively associated with the emergence of PPP in Morocco.

Moreover, in this context, it is necessary for the public power to find the adequate formula to conciliate the limited public resources with the increasing and progressive need of public infrastructure. This reconciliation will be reinforced by a legal and administrative arsenal favoring the use of the private sector to finance and operate public goods and services. In this perspective, there are several measures to adjust the macroeconomic balance as well as various reforms affecting both public finance and its components, including the contribution of the private sector through the PPP, which allows the release of additional funds to support the development of sectors with social and economic priorities. From this perspective, the following hypothesis is necessary to master the issues related to the various socio-economic structures:

H.5 : The imperatives related to the requirements of socio-economic development of the society are positively associated with the emergence of the practice of PPP in Morocco.

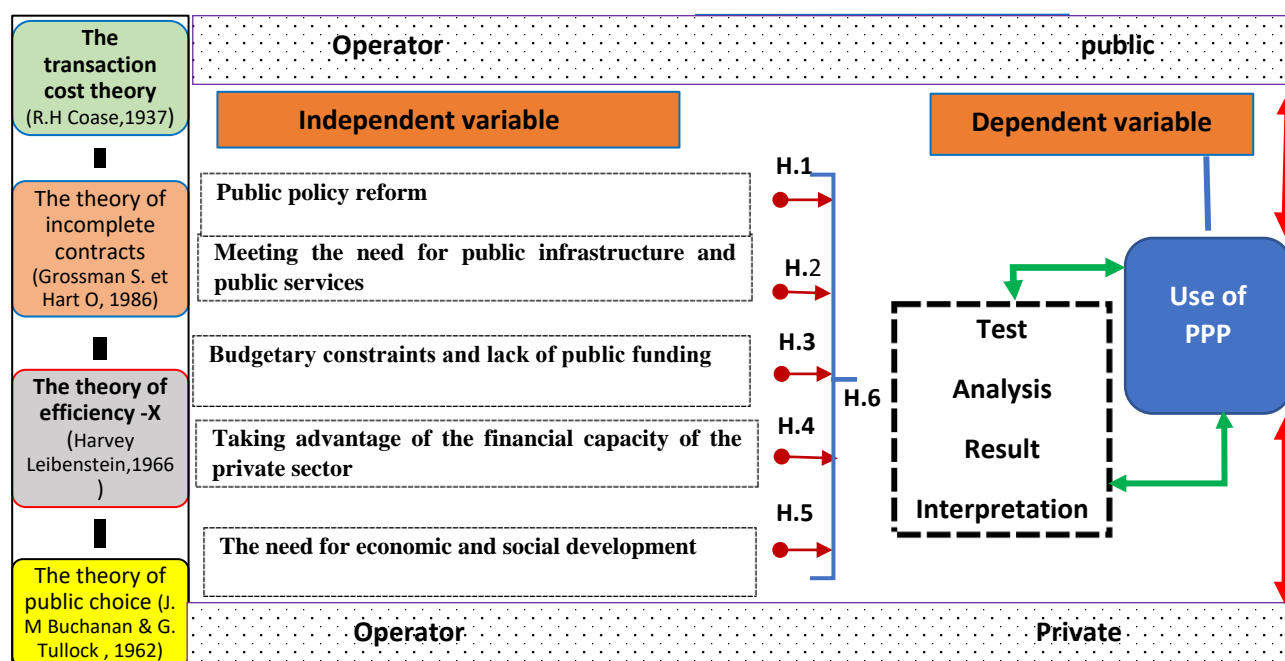
The analysis of the motivations of adoption of the PPP of socio-economic order can be articulated around the constructs quoted below, by taking into account that there is a certain

amount of effect of synergies and complementarity between certain constructs of this dimension. Therefore, the following hypothesis will be exposed in the following way:

H.6 : The "Socio-economic" constructs positively affect Morocco's use of PPPs,

Based on the literature and all that we have discussed in this research work, we structure the ideas previously stated in the following model, with a view to verifying it empirically in the rest of our work.

Figure n°1: The conceptual research model



Source : Established by the authors and adapted from Khaddar and Bensbahou (2020)

This model aims at representing in a graphic way the determinants leading to a solution allowing the implementation of structuring public projects around a financial and legal structure of PPP. These determinants represent in our conceptual model the possible causes that have favored the existence of a PPP formula in Morocco, and they will be evaluated according to the perceptions of the private and public sector in the perspective of presenting, understanding and analyzing the conditions favoring the public decision in terms of partnership with the private sector.

3.2. Research Methodology

In order to evaluate our conceptual research model, we opted for a questionnaire survey as part of a comprehensive quantitative method based on a hypothetical-deductive approach in which we seek to know whether our predefined hypotheses are statistically tested.

A questionnaire survey was administered between January and July 2020. The target of this questionnaire was people with experience in PPP or with an interest in PPP. During this period, survey respondents were asked to rate their level of agreement, attitudes and opinions with respect to each of the identified variables contributing to the emergence of this contractual practice according to a five-level Likert scale of importance.

The present study was conducted in the Moroccan context where we targeted for the constitution of our sample the people directly or indirectly involved in the PPP process. These are 52 directors, 33 heads of division, 36 heads of departments, 16 heads of office and 37 expert researchers.

For this study, we chose to administer our questionnaire through all possible channels likely to make us reflect the true perception of our respondents from the perspective that they have

fully understood the questions they are asked to answer. The total number of questionnaires that were retained is 174 distributed according to the following channels:

- ✓ 54 questionnaires were administered face to face with the respondents by ourselves,
- ✓ 120 questionnaires were administered via the electronic portal, possibly accompanied by telephone, and in order to ensure a degree of reliability of the outputs of our questionnaire, our electronic and telephone coordinates were put on the header of the questionnaires for any additional information or clarification.

Thus, an exploratory approach was adopted through two types of analysis to examine the reliability and validity of our measurement instruments used in this study, firstly to perform a reliability analysis with reference to the Cronbach's alpha index and secondly an exploratory factorial analysis to ensure the unidimensionality of the measurement items used for each variable of our research model.

The construction of this theoretical and conceptual model, as well as the objective of our research (predictive model) leads us to opt for a multiple linear regression analysis in order to estimate the models set up by the researcher and to test hypotheses emanating from our exploratory study in the perspective of finding out to what extent the independent variables selected explain the dependent variable.

The regression model for this study is written as follows:

$$Y_1 = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \epsilon \text{ knowing that:}$$

Y_i represents the dependent variable and X_i are the independent variables, β_i are the parameters to be estimated, β_0 : is a constant and ϵ are the errors found in the observation of Y and X_s . In other words, this model is written as follows :

$$Y \text{ (VD_Recours_PPP) } = \beta_0 + \beta_1 \text{ (C1-REF_AP) } + \beta_2 \text{ (C2-SAT_BISP) } + \beta_3 \text{ (C3_Cont_BFPF) } + \beta_4 \text{ (C4_Prof_CFSP) } + \beta_5 \text{ (C5_EXIG_DES) } + \epsilon$$

4. Results and discussion

4.1. Data analysis

The measurement scale for all variables in this model expressed excellent reliability with Cronbach's Alpha ranging from .757 to .862. This value exceeded the minimum threshold of 0.70 required (Nunnally, 1978) which was retained for this study. Thus, we can see that the composition of these scales and the set of items mobilized in this study allowed us to obtain a satisfactory internal consistency and the items associated with each variable are considered necessary since they allow us to decrease the internal consistency for each variable in case of deletion of one of them.

In order to test the possibility of factoring the constituent items of each variable, we mobilized the Kaiser, Meyer, Olkin (KMO) and Bartlett's sphericity tests which are presented in the table below. Indeed, the KMO index associated with these variables can be qualified as satisfactory since it varied between 0.650 and 0.815, and the Bartlett's sphericity test is significant ($p < 0.0005$). Thus, this result allows us to conclude that the inter-item correlations and the sampling quality are of good quality. Therefore, the data of these variables are factorizable which will allow us to continue the analysis.

Table 3: Summary of the reliability and validity analysis

Variable	Items	Alpha Cronbach	VTE ⁽¹⁾ (ACP)	KMO Index ⁽²⁾	Bartlett test ⁽³⁾	r ⁽³⁾
C1-REF_AP	4	0,787	61,14	0,781	190,95****	0,480
C2-SAT_BISP	3	0,757	67,45	0,650	136,06****	0,509
C3_Cont_BPFP	5	0,862	64,78	0,805	362,56****	0,557
C4_Prof_CFSP	3	0,853	77,25	0,715	232,45****	0,658
C5_EXIG_DES	4	0,842	68,06	0,776	291,84****	0,572
VD_Recours_PPP	5	0,803	60,78	0,815	252,75****	0,448

Number of observations : n = 174

(1) Total variance explained by the extracted component alone (ACP)

(2) Kaiser-Meyer-Olkin index for measuring sampling quality

(3) Bartlett Sphericity Test : Approximate Chi-square

Threshold of significance is : **** P < 0,001 ; *** P < 0,01 ; ** P < 0,05 ;

Mean inter-element correlations = 0,448

Source: Authors

Exploratory factor analysis was carried out. The results reveal the existence of a single component that explains more than the required threshold (60%, Hair et al., 2006) with a minimum and maximum value of the total variance explained amounting respectively to 60.78% for the dependent variable VD_Recours_PPP and 77.25% for the independent variable C4_Prof_CFSP. We can therefore conclude that these measurement scales related to our research model are unidimensional with an excellent level of internal consistency.

4.2. The quality of the inter-variable dependency

The correlation matrix shows that there is a significant degree of dependence on the 1% level between the different variables of the model, this relationship informs us about the degree of linkage between the socio-economic variables and the use of the PPP practice in Morocco, while it does not demonstrate that there is a causal relationship between any of the independent variables and the latent (dependent) variable.

Table 4: Bivariate correlation matrix

	C1_REF_AP	C2_SAT_BISP	C3_Cont_BPFP	C4_Prof_CFSP	C5_EXIG_DES
C1_REF_AP	1				
C2_SAT_BISP	,374**	1			
C3_Cont_BPFP	,389**	,291**	1		
C4_Prof_CFSP	,333**	,615**	,514**	1	
C5_EXIG_DES	,432**	,498**	,494**	,499**	1
VD_Recours_PPP	,346**	,455**	,531**	,561**	,713**

** The two-way Pearson correlation is significant at the (P< 0.01 ; n=174).

Source: Authors

Thus, the respondents to our research study believe that the socio-economic variables have a significantly significant positive relationship with the use of PPP projects in Morocco, the result also shows that the highest correlation coefficient with the dependent variable is that recorded by the "requirement of economic and social development" with a percentage amounting to (r = .713), followed by the variable "take advantage of the financial capacity of the private sector" with r = .561 and the "budgetary constraints and shortage of public funding" with r = .531.

When reading the correlation matrix, we can see that the degree of dependence between all the variables does not exceed 80%, which may explain the absence of the problem of multi-collinearity between the variables in the model.

We also find that the adoption of contractual practices in the PPP framework is weakly influenced by "policy reform" with the lowest correlation coefficient of $r = .346$. Similarly, we find that the highest value of dependence recorded between the explanatory variables is between the variable "meet the need for public infrastructure and the variable "take advantage of the financial capacity of the private sector", this value amounts to $r = .615$ with a significance level of 1%.

Given the values presented in this matrix, we can emphasize that the variables that have strong influences on the dependent variable (variables with an r coefficient >0.5) can potentially positively impact the use of PPP when estimating the linear regression model later on.

After this study of dependence, which does not provide clear information on the participation of each variable in the interpretation of the dependent variable, the next part will be devoted to the confirmatory analysis, which will enable us to confirm or refute the hypotheses put forward by referring to the linear regression technique.

4.3. Goodness of fit of the regression model

This research study seeks to identify the variables of a socio-economic nature that explain the emergence of PPP in Morocco as an alternative modality for financing and delivering large-scale public projects. Thus, the exploratory study we conducted allowed us to identify five independent variables that can potentially explain the use of PPP. The linear multiple regression technique that we implemented allowed us to learn about the overall goodness of fit of our predictive model and to estimate its parameters associated with each independent variable in order to estimate the level of impact that they had on the dependent variable. Table 5 summarizes the regression results of our research model.

Table 5 : Regression model for the "socio-economic" dimension

Model	Hypothesis	Variables Predictors	Unstandardized Beta (β)	Test-t	P-value	
<ul style="list-style-type: none"> Dependent variable : VD_Recours_PPP Regression method : Enter Introduced variables : all 		Constante	,118	2,859	,005	
	H.1	C1-REF_AP	-,021	-,428	,669	NS
	H.2	C2-SAT_BISP	,026	,441	,660	NS
	H.3	C3_Cont_BPFP	,149	2,665	,008	***
	H.4	C4_Prof_CFSP	,175	2,843	,005	***
	H.5	C5_EXIG_DES	,443	8,038	,000	****

$R = ,763$; $R^2 = ,582$; Adjusted $R^2 = ,569$; $n = 174$; Fisher test ($F_{\text{Observed}} = 46,71$, $P < 0,001$) ; $DW = 1,985$

Significance level is : ******** $P < 0,001$; ******* $P < 0,01$; ****** $P < 0,05$; ***** $P < 0,1$; **NS** : $P > 0,1$.

DW : Durbin-Watson test

Source : Authors

The ANOVA test confirmed that the goodness of fit of our search model is globally significant, the ratio of the observed Fisher test (5.173) = 46.71 is significant at the $p < 0.001$ threshold, which explains that the regression model adopted is a good fit of the data exploited in this study and that it is able to predict our search phenomenon with a value amounts to 58.2%.

First, the estimated parameters of our search model are written as follows:

$F(\text{VD_Recours_PPP}) = 0.118 - 0.021 * \text{C1-REF_AP} + 0.026 * \text{C2-SAT_BISP} + 0.149 * \text{C3_Cont_BPFP} + 0.175 * \text{C4_Prof_CFSP} + 0.443 * \text{C5_EXIG_DES} + 0.041$

As shown in Table 5, the regression result confirms that the adjusted R^2 coefficient = 0.569 , i.e., the combination of all the independent variables introduced into the model manages to explain about 60% of the total variance of the model. In other words, the regression model adopted in this research study predicts 56.9% of the information of our studied phenomenon

(the use of PPP). This proportion materialized by adjusted $R^2 = 0.569$ is considered very relevant in relation to the number of variables introduced and the complexity of the phenomenon studied.

4.4. Hypothesis testing and estimation of regression parameters

For the purposes of this study, the research hypotheses that were formulated are presented successively in the summary table below. The research model shown in Figure 1 is composed of five independent variables, each of which is associated with a hypothesis in addition to the overall hypothesis grouping all the variables introduced into the model. Therefore, we consider it very useful to question all these hypotheses within the framework of a multiple linear regression model in order to be able to test them on the basis of all the responses constituting our sample. To this end, the focus of all the hypotheses that will be tested hereafter is to verify the extent to which the variables constituting our research model contribute favorably and significantly to the use of PPP in Morocco.

In what follows, we seek to confirm the extent to which the explanatory variables of our model are significant in explaining the use of PPP (the dependent variable).

4.4.1. Research hypothesis related to the independent variable C1-REF_AP

The correlation matrix in Table 4 above indicates that the adoption of PPP contracting practices is weakly influenced by "policy reform" with the lowest correlation coefficient of $r = .346$. That is, this variable has a weakly significant relationship at the 1% threshold. This is because the relationship of influence between this independent variable and the variable to be explained (the use of PPP) does not inform us correctly about how much this explanatory variable contributed to the explanation of the dependent variable in a multiple linear regression model.

Indeed, the result of the study shown in Table 5 confirmed that the variable "Public action reform" explains only about 2% of the dependent variable and in the opposite direction, as we can see through the regression result obtained that the actions falling within the framework of public action reform do not significantly affect the use of PPP in Morocco, the regression result rejected the hypothesis H.1 with a negative coefficient $\beta = -0.021$ and $p\text{-value} = 0.669 > 5\%$. Thus, hypothesis H.1 is not tested.

4.4.2. Research hypothesis related to the independent variable C2-SAT_BISP

Reading the correlation matrix in Table 4, we see that the lowest Pearson correlation coefficient, after the variable C1_REF_AP, is associated with the independent variable "Meeting the need for public infrastructure and public services", which then has one of the lowest Pearson coefficients in the matrix with the dependent variable "the use of PPP", with a percentage of $r = 0.455$. Thus, we can see that there is a positive influence relationship of this variable with the use of PPP, but with an average low degree of correlation.

Similarly, so the linear regression analysis performed on our sample resulted in the independent variable "meet the need for public infrastructure and services" having a β value of 0.026 at $p = 0.660 > 0.1$. This shows that there is not a significant relationship between the desire to meet the need for public infrastructure and services and the adoption of PPP in Morocco, i.e., the deficit in public infrastructure and services could not be interpreted as a significant cause behind the emergence of PPP in Morocco. Therefore, the regression result confirmed that hypothesis H.2 is not verified.

4.4.3. Research Hypothesis Related to the Independent Variable C3_Cont_BFPF

Budgetary constraints and lack of public funding is a variable often cited in the literature as an explanatory factor for the adoption of PPP, for this research and reading the linear regression

model shown in Table No. 5, it appeared that this independent variable contributes significantly to the emergence of PPP in Morocco with a β of 0.149 at $p = 0.008 < 1\%$.

The budgetary and public financing constraints may reflect the efforts made by public authorities to be able to obtain the necessary resources for the realization of public projects under the PPP formula, as it is also important to note that the possibility of accounting "off-balance sheet" the financial capital committed in the framework of PPP projects has made this practice attractive especially for public sector financial administrators.

To this effect, the unanimity of our respondents was positive on this variable giving it a coefficient $\beta = 0.149$ with a significance level $p < 0.01$, this implies that this variable positively affects the use of PPP in Morocco. Thus, hypothesis H.3 was accepted.

In the opposite direction, the results of Yin Wang and Zhirong Jerry Zhaob (2014) announce that the public debt burden and the debt ceiling of state funds are negatively associated with PPP. They consider that this negative relationship between debt level and PPP adoption can be explained by the substitutive nature of these alternatives, public versus private financing. Also, in their view, some states are more open to the use of PPPs because they have made a strategic decision to use more private financing as an alternative to public financing.

Like several authors in their previous work on PPPs, Campagnac and Deffontaines (2012) share a similar view to ours, as they also believe that the emergence of PPPs is justified by the fact that they provide additional funds in times of budgetary constraint. This is evident in the studies by Li et al. (2005b) and Cheung (2009), who found that this was among the main factors that drove the adoption of PPPs in the United Kingdom and Hong Kong, respectively.

Similarly, the result of this study is perhaps convergent with that of Hammami et al., (2006) who confirmed that PPPs tend to be more common in countries where governments are heavily indebted and where aggregate demand and market size are large.

4.4.4. Research hypothesis related to the independent variable C4_Prof_CFSP

The results of the regression indicated in Table 5, showed that the desire to take advantage of the financial capacity of the private sector had a significant effect on the adoption of projects under the PPP formula with a coefficient $\beta = 0.175$ at $p = 0.005 < 0.01$, this variable C4_Prof_CFSP contributed a value the most important after that recorded by the variable C5_EXIG_DES to explain the variance of the dependent variable which is the use of PPP.

This impact can be interpreted by the strong pressure on the government's financial situation, which makes it unable to fill the huge infrastructure and public services deficit on its own. For this reason, it is important that Morocco, like other countries, begins to find the appropriate formula (PPP) that allows it to engage private investors who have the capacity to raise substantial funds for large-scale infrastructure projects.

The present regression result confirmed that the explanatory variable "taking advantage of the financial capacity of the private sector" positively affects the use of PPPs in Morocco, thus hypothesis H.4 is verified.

This empirical confirmation appeared to be consistent with other similar studies, notably that of Jones et al., (1996), who considered that private sector participation in the provision of public infrastructure reduces the amount of public funds tied up in public investments. For example, Walker and Smith (1995) found that the private sector has the ability to raise considerable funds for large-scale construction projects, thereby reducing the government's financial burden. Furthermore, Carbonara and Pellegrino (2014) mentioned that the main motivation for adopting PPPs in Italy was to tap into the expertise and financial capabilities of the private sector.

Given that the private business culture stipulates that each private investor is obliged to minimize its costs as much as possible and maximize its revenues and profits for each investment project. This financing capacity associated with the private sector is largely due to

its managerial and technical capacity, which allows it to easily raise considerable funds for large-scale projects.

4.4.5. Research Hypothesis Related to Independent Variable C5_EXIG_DES

The regression results in Table 5 showed that the explanatory variable "economic and social development requirement" has a significant impact on the use of PPP by the Moroccan authorities, this variable is considered the most significant among the five explanatory variables of our regression model in explaining the adoption of PPP, with a coefficient $\beta = 0.443$ at $p = 0.000 < 0.001$.

This explanatory variable contributed in a most significant way in the explanation of PPP use as it carrying the highest $\beta = 0.443$ coefficient with the highest significant threshold $p < 0.0001$ in the regression model. From this, it is essentially important to conclude that hypothesis H.5 is confirmed.

Firstly, it appears that this confirmation is inevitable and can be explained by the inescapable and even indispensable value of the development of economic and social activities in the country to ensure the sustainability of the conditions of economic growth and the satisfaction of the welfare of the population. In this perspective, several measures of adjustment of the macroeconomic balance as well as various reforms touching at the same time the public finance and its components of which the contribution of the private sector through the PPP which makes it possible to release additional funds to support the development of the sectors with social and economic priority.

4.4.6. Research hypothesis related to the set of socio-economic variables in the model

From the perspective of discussing the impact of the socio-economic variables introduced in the model on the use of PPP in Morocco, the regression results indicate that 56.9% (adjusted $R^2 = .569$) of the total variance of the model is explained by the introduced explanatory variables and the model is globally significantly with an observed Fisher test $(5.173) = 46.71$ at the highly significant threshold $p < 0.001$. Moreover, the regression coefficient associated with the first two explanatory variables that are not validated by the regression model remains very poor and insignificant (β (C1-REF_AP) = - 0.021 and β (C2-SAT_BISP) = 0.026). From this, we can conclude that hypothesis H.6 is partially verified.

First, this regression study confirms once again that the factors that have a socio-economic character favor the provision of public projects under the PPP formula, this can be explained by the fact that decision makers are convinced that it is necessary to take the measures and actions that have a close relationship with economic, financial, societal and market changes including the private sector as a determining operator in the conduct of public finance towards the macroeconomic balance.

The deterioration of macroeconomic balances that Morocco has experienced reflects in large part the inefficiency of public policies followed and the inadequacy of the strategic choice adopted in terms of the role of the State and the quality of public investment.

In this period several indicators have confirmed the poor health of the Moroccan economy, such as the level of public indebtedness, the budget deficit and the current account deficit of the balance of payments as well as the failure to adopt good practices to extinguish the quality of service, the efficiency of action and the optimization of public spending.

5. Conclusion

In this research study, we have focused our analysis on what explains the emergence of this contractual practice in the public sphere and more particularly the influence of certain socio-economic reasons for the use of PPP. For that, we put in examinations several empirical and

theoretical works of research to bring out the reasons as well as the potential motivations of socio-economic orders which will be able to answer on the question of why the public power is attracted by the adoption of the PPP.

In this research work, the emphasis was first placed in the qualitative phase on the contextualization of the variables in order to select those that could constitute the conceptual research model. In a second phase, another quantitative analysis was carried out in order to identify and confirm the explanatory factors of the use of PPP in Morocco. In this phase of empirical analysis, a set of statistical methods and techniques were used to answer our central research problem. These include an exploratory analysis guided by PCA and Cronbach's Alpha and a confirmatory analysis based on the multiple linear regression method and certain statistical tests.

In the analysis of the research data, we found that all the variables constituting our conceptual research model expressed excellent reliability with Cronbach's Alpha ranging from 0.757 to 0.862. This value exceeded the minimum threshold of 0.70 that was retained for this study (Nunnally, 1978). Thus, the KMO test and Bartlett's sphericity test that we mobilized allowed us to observe the possibility of factoring the constituent items of each variable. As a result, the data for these variables were factorizable.

In this paper, six research hypotheses were tested using the multiple linear regression method. The result obtained revealed that four hypotheses were validated while the remaining two hypotheses were rejected. Thus, the result obtained confirmed that the main socio-economic reasons explaining the adoption of PPP in Morocco in order of importance are "budgetary constraints and shortage of public funding", "taking advantage of the financial capacity of the private sector" and "requirement of economic and social development". Similarly, the results of the study showed that the variables "public policy reforms" and "meeting the need for public infrastructure and public services" have no significant effect on the use of PPPs in Morocco.

First, this research has made contributions to different dimensions of knowledge that will have theoretical, methodological and empirical implications.

Theoretical contributions

In this sense, the study has allowed the design of a theoretical model related to PPP whose complementarity and harmonization of the mobilized theories is thoroughly explained and validated in the study context. Thus, this thesis work has contributed significantly in the harmonization of a large and diversified theoretical corpus to frame and explain the PPP phenomenon.

Methodological Contributions

Moreover, the methodological framework adopted during the elaboration of this work has brought plus in terms of organization and structuring. On the one hand, the deepening of the methodological notions and concepts adapted to the management sciences allowed to understand how to conduct research in this field. On the other hand, the complementarity of the qualitative and quantitative methods allowed us to have more relevant answers to our initial questions.

Empirical Contributions

To our knowledge, this research is one of the first empirical studies that have systematically examined the factors responsible for the emergence or adoption of PPP in the Moroccan context. Therefore, we hope that this research work can help fill this gap. Thus, a database amounting to 174 observations, which was collected from experts who have a close relationship with the research object, may be useful for conducting further research.

Limitations and Constraints of This Study

As with any research, several limitations characterize ours, and thus, despite the fact that this work has provided relevant solutions to understand and predict the behavior of actors outside the adoption of public PPP projects in Morocco, we have not been able to analyze some internal and external aspects that are related to PPP practices. For example, it is necessary to carry out evaluations of public choices in PPP through which other themes related to performance and socio-economic impacts will be very useful to fully understand the PPP phenomenon. And this, in a context where data are available, reliable and accessible, which was not present in the context of our study. To this end, the competent authorities are all invited to set up an observatory specialized in the processing of strategic and operational information related to PPP, statistics and data centralization, analysis and evaluation of PPP projects in Morocco.

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